

REMARKS

Applicants confirm the oral election of Group I (claims 1-18) with traverse.

It is respectfully submitted that the restriction requirement should be withdrawn. It has been justified on the grounds that instant product, or more particularly the water soluble acrylic binder, can be made by emulsion polymerization. However the method claims of Group II do not call for a binder preparation process which excludes emulsion polymerization. Accordingly, this justification is not valid.

The restriction requirement has also been justified on the grounds that the groups have acquired a separate status in the art is shown by their different classification and therefore the search required for Group II is not required for Group I. The restriction requirement, however, does not identify the entire search area for the two groups and therefore the office has not shown that the search is not the same or at least substantially the same. It is therefore respectfully submitted that this justification is also not been established.

In light of the foregoing considerations, withdrawal of the restriction requirement is respectfully requested.

Claims 1-8 and 10-18 were rejected under 35 U.S.C. 102 or 103 over Hessel. This rejection is respectfully traversed.

Ceramic slurries containing a ceramic material, water and a water-soluble acrylic binder have been proposed recently. However, the water soluble acrylic binders used have a high solution viscosity and the slurry formed using such a binder also has a high viscosity. As a result, the slurry has lower flow characteristic as well as a degraded dispersion characteristic for the ceramic raw material powder, which make it difficult to obtain uniform ceramic green sheets. Attempts to decrease the slurry

viscosity by either increasing the amount of the aqueous solvent or decreasing the molecular weight of the binder have been proposed. Increasing the amount of aqueous solvent, however, results in the drying characteristics being degraded which in turn results in the generation of cracks in the multilayer ceramic parts eventually made. Changing the molecular weight also changes the mechanical properties of the ceramic green sheets such that their tensile strength and elongation rate are decreased. The present invention has been designed to overcome these deficiencies.

The independent claim under examination calls for a ceramic slurry composition containing a ceramic raw material powder, an aqueous solvent and a water-soluble acrylic binder which has a weight average molecular weight of from about 10,000 to 500,000 and an inertial square radius of not more than about 100 nm in the aqueous solvent. Hessel does not teach or suggest such a slurry composition.

The Hessel reference teaches a composition which is a combination of a ceramic powder, binder and dispersing agent. The dispersing agent is essentially water and the binder is an emulsion copolymer of a (meth)acrylic ester and an unsaturated carboxylic acid in the form of microbeads.

The Office Action asserts that the acrylic copolymers of the Hessel examples "inherently possess the instant weight average molecular weight". The basis for this insertion is not stated. Acrylic emulsion copolymers frequently have molecular weights of 1,000,000 or more, which is far outside the range specified in the instant claims. Reliance on inherency is not proper unless the inherency is certain and there is no basis on which the Office can assert that inherency is certain here. On this basis alone, the rejection is untenable.

In addition, given the fact that the dispersing agent is essentially water in the Hessel composition and in the emulsion copolymer is in the form of microbeads, it is readily apparent that the Hessel emulsion copolymer is not water soluble. The instant claims, however, call for a water-soluble acrylic binder. On this basis alone, also, the rejection is not tangible.

Beyond the foregoing, the Office Action appears to equate inertial square radius with average particle size. Hessel's average particle size, however, clearly refers to a dimension of the microbeads, such as the diameter in the case of a perfect sphere. Inertial square radius, on the other hand, represents the size of a molecule in aqueous solution and thus indicates the extent of spreading when the polymer is dissolved in the aqueous solvent. The two terms are not synonymous.

Each of the foregoing considerations, standing alone, is sufficient to eliminate this rejection. Taken together, the instant claims are clearly neither anticipated nor obvious over Hessel.

While unnecessary to eliminate the instant rejection, it should be noted that it would be impossible for Hessel's binder to satisfy the requirements of claim 2 of the instant application since that binder is not water-soluble.

Claims 1-18 were rejected under 35 U.S.C. 103 over Hessel in view of Miyazaki and either Sambrook or Masaki. This rejection is also respectfully traversed.

The Hessel reference has been discussed above. Miyazaki has been cited to show an acrylic copolymer having a number average molecular weight of 5,000 to 300,000, apparently assuming number average in weight average molecular weights are identical terms (which they are not). The Sambrook and Miyazaki references have been

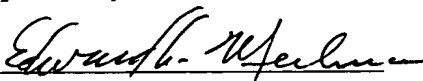
cited to show the water solubility of an acrylic polymer can be increased by use of a salt form.

Even assuming these characterizations of the secondary references are correct, and ignoring the deficiencies in the primary reference which they do not cure, there is no motivation to combine these references as proposed. The secondary references merely teach that an acrylic polymer having a given molecular weight is known and it is also known how to increase or solubilize an acrylic polymer. However there is nothing in these references which suggest picking one molecular weight as opposed to a different molecular weight or solubilizing a polymer. The absence of motivation, as well as the other deficiencies in the references, are respectfully submitted to render this rejection untenable.

In light of all of the foregoing, it is respectfully submitted that this application is now in condition to be allowed and the early issuance of a Notice of Allowance is respectfully solicited.

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Respectfully submitted,

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